ENTOMOLOGICAL NEWS

AND

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SOME EXPERIENCES IN LARVÆ REARING.

BY ROBERT BUNKER.

(Continued from page 110, vol. i.)

Occasionally we find a rare larva that has been stung by some saucy ichneumon fly, and if we can save it in the manner described on page 109, it will certainly be a great gain. Of course it must be done within a few days after the young worms have entered the body of their host, or it will be of no use. The inference to be drawn from this kind of treatment is that the chloroform penetrated the body of the larva and destroyed the young parasites, but was not in sufficient quantity to injure the larva.

Can the pupa of *Darapsa versicolor* remain under water two weeks without injury? The past two years I have bred this fine species from eggs found on the button bush (*Cephalanthus occidentalis*) and last year's catch of eggs was a surprise to me, because the low ground where the bushes grow was submerged for two weeks, and of course the pupa must have been under water that length of time, and yet when the proper time came around I found eggs. Some may say the eggs may have been laid by females that came from a distance, but that could hardly be, as the nearest bushes are six miles distant. Mr. Hulst has written

up the life-history of this species, so I will only add that the larva vary from a maroon-brown to a light green, are very domestic in their habits and extremely interesting. *Darapsa chlœrilus* differs from the foregoing in depositing its eggs. They are sometimes laid singly and sometimes *en-masse*, I once found twenty-two in a cluster on the Azalea (*Azalea nudiflora*).

Smerinthus myops varies principally in the number and color of the sub-dorsal spots; some have eight, four on each side, some six, more often four, and not unfrequently two, and one specimen, a regular unique, had but one spot, and that was situated on the right side of third segment. But the climax of all was a brood of nine I raised two years ago, which were destitute of spots. I examined them very carefully, and not a vestige of a spot could be seen. These immaculate specimens were light green without the bluish tinge characteristic of most of them. The diagonal lateral lines were very indistinct. When this unique group came out winged flies I found the sexes about equally divided, and was in hopes to get a pairing and thereby ascertain whether the larva would inherit the characteristics of their progenitors, but I failed. Another characteristic of all I have bred so far is the spots were cardinal or shumach-red, instead of rust-red.

In most cases the larvæ of a species varies far more than the imago, but in *Smerinthus geminatus* the reverse seems to be the order of things, and no doubt the food-plant has something to do with it; the eggs are found on willow and on poplar. The eggs found on poplar are larger than those found on willow; the imago is proportionally larger, the shading much deeper, and on the whole a much finer insect than the willow feeders.

Many more instances of marked varieties might be mentioned, but this paper is now longer than was at first intended, and I will close by a few remarks on the larva of *Smerinthus astylus*. Last Summer, after four hours' search on the high bush huckleberry (*Vaccinium corymbosum*) I found a young worm, half an inch long, of a bright green color. It moulted three times, but supposing the species had been described, I did not make a description of it till after the last moult, which runs as follows:

Larva bright green, 2¾ inch. long, ⅜ inch. diameter, uniform in size, with seven, oblique, lateral, red lines, margined with yellow on the under side; caudal horn black, base greenish yellow, nearly straight and smooth. Head with a pea-green stripe on the side; under side below the stigmatal spots sea-green, thickly studded

with very small, blue-black rings, extending the entire length of the body, and covering the upper as well as the lower part of the thorax; spiracles red.

It will be seen by the foregoing that my description differs very materially from that of Mr. Jones, and is either a marked variety or a distinct species.

———o———

ELEMENTARY ENTOMOLOGY.

Fourth Paper—THE MOVABLE PARTS OF THE HEAD.

The antennæ or feelers, are jointed appendages inserted on the epicranium between or in front of the eyes. *Regular* antennæ have the joints of similar shape; *irregular* antennæ have the joints of dissimilar shape; intermediate forms of antennæ of course occur. Technical names are applied to the different forms of antennæ. Of regular antennæ the more common forms are:

Filiform (thread like), having the joints of uniform thickness, or nearly so.

Setiform or *setaceous* (bristle like), having the joints successively more and more slender from the base* of the antenna to its apex.

Subulate (awl shaped), similar to setaceous, but the transition from the thick basal joints to the slender joints is more abrupt.

Moniliform (necklace like) having the joints globular.

Serrate (saw like), having the joints triangular, arranged like the teeth of a saw.

Pectinate (comb like), each joint having a long process or projection on one side, the whole arranged like the teeth of a comb (fig. 2).

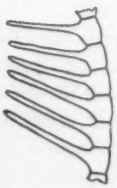

Fig. 2. Part of a pectinate antenna (*Chauliodes pectinicornis* L.).

Pinnate (feather like), each joint having one or more projections on each of two opposite sides, the whole looking like a feather.

Of irregular antennæ, the more common are:

Clavate (club shaped), having the apical joints somewhat more enlarged than the others.

Capitate (with a head, knobbed), having the terminal (apical) joints greatly enlarged to form a knob.

* The base of any limb or appendage is that part by which it is attached, directly or indirectly, to the trunk, the apex is the opposite end, farthest from the trunk.

Lamellate (plate like), having the terminal joints extended on one side into broad plates (figs. 3 and 4).

Fig. 3. A lamellate antenna (*Pleocoma Ricksecker*i Horn, male).

Fig. 4. A lamellate antenna (*Pleocoma hirticollis* Horn, female).

An irregular antenna may often be divided into portions of a varying number of joints. In such an antenna as that shown in fig. 5 the first or basal joint is the *scape*, the second joint is the *pedicel*, all the remaining joints compose the *clavola* or *flagellum*. The clavola may itself consist of several portions (fig. 6); its apical joints may be enlarged to form the *club;* its proximal* joints may be very short and small, and are then termed *ring-joints;* between the ring-joints and the club is the *funicle*.

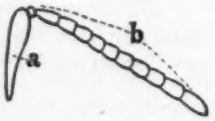

Fig. 5. An irregular antenna of a Hymenopter.
a, scape, followed by a small joint—the pedicel; *b*, clavola, of ten joints.

Fig. 6. Antenna of Chalcis fly.
a, scape; *b*, pedicel; *c*, two ring-joints; *d*, funicle of five joints; *e*, club; *c*, *d* and *e* together, form the clavola.

The mouth parts or *trophi*, differ to a very great extent in the various groups of insects, so much so that Fabricius, the celebrated entomologist of the last century, founded his classification of insects almost entirely on the modifications of the *trophi*. These modifications result from the nature of the food. Many insects living on liquids, such as the nectar and honey of flowers, suck up those liquids through a tube or proboscis. Others, feeding on animal or vegetable solids require hard cutting parts to tear those solids in pieces.

But however much these modifications existing in different insects may differ from each other, there is one general, typical form and arrangement of the mouth parts, to which all the modifications may be referred. This typical arrangement is as follows:

The mouth opening is situated between the front edges of the clypeus above and the gula below. Attached to the lower (front) part of the clypeus is the *labrum* or upper lip (*c*, fig. 1†; *d*, fig. 7). To the fore part of the gula is attached the *labium* or lower lip

* *Proximal* in treating of a limb or appendage refers to parts or joints nearest to the trunk as distinguished from *distal*, farthest from the trunk.

† Page 104 of this volume of ENTOMOLOGICAL NEWS.

(*e*, fig. 7). Between the labrum and the labium are two pairs of jaws whose normal movement is horizontal, not vertical, as in the backboned animals. The upper (dorsal) pair—nearest to the labrum—are the *mandibles* (*d*, fig. 1; *f*, fig. 7), the lower (ventral) pair are the *maxillæ* (*g*, *h*, *i*, fig. 7).

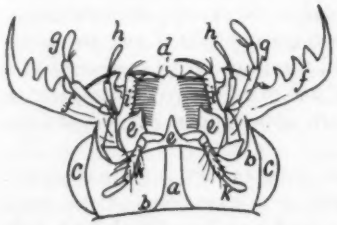

Fig. 7. Typical arrangement of mouth parts. Under side of head of Tiger-beetle (*Cicindela*).
a, gula; *b*, *b*, genæ; *c*, *c*, compound eyes; *d*, front margin of labrum; *e*, *e*, *e*, labium; *f*, mandible, showing four teeth; *g*, four-jointed maxillary palpus; *h*, two-jointed galea; *i*, lacinia; *k*, four-jointed labial palpus; *g*, *h* and *i*, are all parts of the maxilla.

Such a typical arrangement exists in the biting insects, as in beetles, crickets, grasshoppers, etc., and is shown in fig. 7.

The labrum usually consists of a single median piece, hinged by its hind or upper edge to the clypeus, by which it may sometimes be concealed.

Next below the labrum are the mandibles. Usually they are one-jointed, and have a cutting edge on the inner side. This cutting edge may either be entire, *i.e.*, unbroken, or toothed.

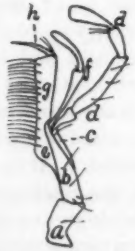

Fig. 8. Ventral side of left maxilla of Tiger-beetle (*Cicindela*).
a, cardo; *b*, stipes; *c*, palpifer; *d*, four-jointed maxillary palpus; *e*, subgalea; *f*, two-jointed galea; *g*, lacinia; *h*, digitus. The suture between the subgalea and the lacinia is obliterated. The figure gives the galea the appearance of being attached to the stipes; its real attachment is to the subgalea, as stated in the text.

On the ventral side of the mandibles are the maxillæ, which are usually very complicated. Each maxilla (fig. 8) consists of a number of joints. The basal joint is the *cardo* or *hinge*, the second is the *stipes* or *footstalk*. The *palpifer*, or *palpus-bearer*, is a joint situated on the outer side of the stipes; as its name indicates, it bears a conspicuous one- to six-jointed palp—the *maxillary palpus*. On the inner side of the stipes is another joint, the *subgalea*, or *helmet-bearer*. The subgalea bears two joints, the *galea*, or *helmet*, and the *lacinia*, or *blade*. The galea and lacinia are each directly attached to the subgalea. The galea is also called the *outer*, *upper*, or *superior lobe* of the maxilla, while the lacinia is the *inner*, or *inferior lobe* of the maxilla. The lacinia "is the cutting or chew-

ing part of the maxilla and is often furnished with teeth or spines;" sometimes it bears a terminal joint—the *digitus*. As often happens in the case of other appendages, the sutures separating contiguous joints of the maxilla become obliterated and the joints unite. In such cases the maxilla appears to be composed of a less number of joints than here described. Careful comparative study alone will show where such obliterations and unions have taken place in any one insect.

Unlike the labrum, the labium, or lower lip, is quite complex. It so much resembles the maxillæ as to have received the name of *second maxillæ*. The labium is to be regarded as a pair of appendages united to each other on the middle line of the body. A comparison of fig. 8 with the right side of fig. 9, will show the correspondence between a maxilla and half the labium, the homologous parts being lettered alike in the two figures. The basal joint of the labium is the *submentum*, which articulates with the gula; it is a single median piece and corresponds to the united cardos of the right and left maxillæ. The second joint, also a single median piece is the *mentum*,* corresponding to the united stipes of the right and left maxillæ. At each outer apical angle of the mentum is the *palpiger*, the homologue of the palpifer. The palpiger bears the *labial palpus*, whose similarity to the maxillary palpus cannot be mistaken. The joint marked *e* in fig. 9 is apparently unnamed; it corresponds to the subgalea, and bears two lobes, an inner (*g*) the *glossa*, and an outer (*f*) the *paraglossa*, corresponding to the lacinia and galea respectively. Excepting the submentum, mentum and labial palpi, all the remaining parts of the labium constitute the *ligula*. Few insects have the joints of the labium so distinct as the Black Cricket (fig. 9). Thus in the labium of the

Fig. 9. Ventral side of labium of Black Cricket (*Gryllus*).

a, submentum; *b*, *b*, mentum; *c*, palpiger; *d*, three-jointed labial palpus; *e*, (unnamed, = subgalea); *f*, two-jointed paraglossa; *g*, glossa. The parts of the labium are here marked with the same letters as the corresponding parts in fig. 8. The mentum is one piece, but there is a line across it. The glossæ are not two-jointed, as the figure might seem to show, what looks like a terminal joint is a thin, membranous portion. The suture between each palpiger and mentum obliterated.

* Some confusion exists as to the use of the term *mentum*. By some it is applied to the part described above as the submentum, in which case that described above as the mentum receives the name of *hypoglottis*. We have followed Comstock and Packard in the text.

Tiger beetle (*e*, *e*, *e*, fig. 7) the sharp pointed middle piece (marked by the middle *e*) appears to represent the united glossæ and paraglossæ, if nothing more.

It is necessary to warn the student that great variation exists in different entomological writings, as to the names applied to the parts of the labium. The nomenclature which is here given is that of Comstock, with very slight modifications; it seems based on sound homologies with the parts of the maxillæ.

Within the cavity of the mouth may be two other organs, the *epipharynx* and the *hypopharynx*. The epipharynx is attached to the inner surface of the labrum, the hypopharynx to the inner surface of the labium; "both are rarely developed in the same insect. . . . The form and position of the hypopharynx" resemble "those of the tongue of higher animals. On this account it has been named the *lingua*, or tongue. But as both of these terms have been applied to the glossa* it is best to designate this part as the hypopharynx, and to avoid the use of the terms lingua and tongue, as liable to be ambiguous (Comstock)."

The foregoing description of the mouth parts is of that referred to above as the typical arrangement, and to be found in biting insects. In various modifications existing in sucking insects, some of the mouth parts may be represented only by bristles, or united to form a sheath. P. P. C.

A NEW APPLE PEST.

BY F. W. GODING, M.D., PH. D.

Empoasca birdii n. sp.—Seen from above long ovate, bright yellow, varying to green; abdomen deeper yellow and attenuated at the extremity. Head length of pronotum, obtusely rounded in front and convex; eyes purple-black; ocelli nearer the eyes than each other; three pale bands passing along the occiput, one at the centre and one at the edge on each side along border of the eyes. Pronotum one and a half times length of scutellum, its posterior border straight, front arched; three large, pale spots on front edge, the mesial one being continuous with the corresponding band on the occiput. Scutellum large, triangular, depressed, having a pale green, broad band on posterior part; apex and base yellow, a dark spot occupying the disc. Abdominal joints gradually decreasing in size; pure yellow. Elytra slightly smoky, with a darker band passing across the centre. Wings hyaline and iridescent, in the former the terminal vein is at the margin, while in the latter has a membranous margin; lower part

* When the two glossæ alone are united into one median piece, this piece is often called the glossa.

of tibiæ and all of tarsi indigo-blue; femora with a row of strong spines. One specimen with all colors much deepened, and some minor differences, may prove to be distinct. Length about 2 mm.; 3 mm. to end of hemilyta; breadth one-third the length.

Described from many specimens. Taken in Illinois from leaves of apple, hop, walnut, bean, and some weeds. I regret to add another to the long list of apple pests, but I am compelled to do so from observations repeated during two seasons. The specimens were taken from May until after heavy frosts. Their injuries to the apple leaves were plainly to be seen, the leaves being discolored wherever a puncture had been made. An account of its injuries appears in the Lacon. (Illinois) "Fruit Grower" vol. i, p. 132, July, 1890.

I take pleasure in dedicating this beautiful little species to my highly esteemed friend, Miss Emma Bird, who has greatly aided me in entomological work for several years.

WHAT CAN IT BE?

BY MRS. JULIA P. BALLARD,
Easton, Pa.

On the 12th of September, 1889, a large "mulberry" colored caterpillar was given to me. Its food-plant was not known. It was very strong and very snappish. There were two pairs of spined horns, one pair on the third and one on the fourth ring, and a strong sharp-pointed spined horn at the end. His whole length was marked by diagonal lines of the same mulberry color, but of a darker shade. These radiated from the central line down his back just like the veinings of a leaf. He was fully three inches in length, quite as large as the caterpillar of the Royal Dryocampa (*C. regalis*). No food offered him proved satisfactory. He resented the slightest disturbance with a sudden, quick motion, jerking about as if in a fury of passion, but kept quite still if not disturbed. I at once recognized him as the same kind of caterpillar I once secured nearly ten years ago.

"I saw an immense caterpillar, as I was coming up the hill, fully three if not four inches long," said a friend coming in one hot June day.

"Why didn't you bring him along?" was the quick response.

"I had no box, and I dare not touch him."

Seeing me don my hat and take up a pencil and parasol, said: "You will not find him; he'll be sure to have gotten away,"

was the not too encouraging remark. But, with the exact locality given (which chanced to be a large stone horse-block at a gentleman's residence, some distance away, and which of course could suggest no food-plant for his meals), I started—and to reward faith and perseverance—he was found on the identical block, captured safely, although snappish at disturbance, and after being secured in his box prison was tempted by every imaginable kind of leaf to be obtained from garden or wood. Nothing would he touch, and of course he soon died without a sign. Had he then been placed upon earth he would probably have "gone down" and become a chrysalis in his own way. At any rate, acting on this thought, the one secured last September was placed on a box of earth and was soon lost to sight, going down on the next day (September 13th). On September 18th, rolling back the earth, I found a fine large chrysalis with an unusual tinge of red in the brown. The rings were formed by two or three narrow and somewhat constricted rings; the chrysalis was broadest in the middle, and tapering to a sharp point at the end. The head has a pinched look and markings, which, as hasty dashes, give the effect of a face, two eye dashes and a horizon mouth line. From that day of September until now (April 13, 1890) he has lain so still that, but for an occasional tremor and a very occasional jerk when slightly touched, one would have said there was surely no life there. But he has moved to-day, and now all one can do by way of satisfying his curiosity is to wait a development, which cannot be far off. A line hinting of a crack down the centre of the front of the head shows where the chrysalis will break, and it is exactly like that of the Imperial Dryocampa (*E. imperialis*).

On April 21st the chrysalis responded to raps upon the box every time (and for the first time) as I have often had the Polyphemus chrysalis do by a rapid movement of the end of its body which shows me it is nearing the time of its change to the imago. Through all the past months it has lain as still as if dead, with a very occasional exception of a slight movement when touched. Ordinarily it made no response to this, and tried one's faith as to any latent life as much as the chrysalis of the Royal Walnut (*C. regalis*) does.

NOTE.—It was suggested that this might be *Ceratomia amyntor*, the four-horned sphinx, but Mrs. Ballard has reared *amyntor*, and the unknown cannot be it.—ED.

A NEW FORM OF CABINET FOR BUTTERFLIES.

BY ISAAC C. MARTINDALE.

Having just had completed a new cabinet, which gives such good satisfaction, I am prompted to acquaint the readers of the NEWS with the manner of its construction, and its many advantages, as it is the best form I have yet seen for easy examination, study, or comparison of specimens. The case is of Walnut, and is made in two sections (thus being more portable), one fitting on top of the other, the upper having sixteen drawers and the lower one twenty-four, each drawer being 24 inches wide by 20 inches deep, and of sufficient height to admit of the use of any ordinary pin. Each drawer has also its separate compartment, this I have found much better than where they slide on runners; the drawers being all interchangeable, admit of any change of location, which so often is found necessary where one's collection is constantly receiving new accessions.

The especial feature is the drawer itself, which, instead of having a cork bottom as is usually the case, has both the top and bottom of glass; the top part of the drawer frame fits tightly over a ledge one inch in height, effectually preventing the intrusion of destructive insects, the pest of the entomologist, but it is readily lifted when it is desirable to add to the contents, or change the location of the specimens. For the inside arrangement I have taken a strip of common tin, one inch wide, and turned up each side five-sixteenths of an inch, thus leaving three-eighths of an inch for the bottom, the length of the strip of tin being about two inches longer than the width of the drawer admits of each end being turned up one inch; into this tin trough is tightly fitted a cork strip three-eighths of an inch square, the whole being covered with white paper, such as is usually used for lining drawers, conceals the inequalities of the cork, and makes a fine finish; they should be made to fit neatly in the drawer, and can be readily moved about to suit large or small specimens; for *Lycænas*, *Pamphilas*, etc., as many as fifteen of these strips may be used in one drawer, and as few as five for *Morphos*, *Caligos*, etc. The upturned ends are fastened in place by using the ordinary thumb tacks that can be procured at any stationer's; the frame work of the drawers should be of White Pine, well seasoned; into this the thumb tacks are readily inserted and as easily withdrawn when a change in the position of the cork strips is needed.

The superiority of this form of case for butterflies will be readily perceived, as the upper and under surface of the wings can be seen by simply turning the drawer without touching the insect, and there is no danger of breaking or injuring specimens. The cost of the case is no greater than if made in the old style.

COLLECTING IN THE WILDS OF PENNSYLVANIA.

BY CHARLES A. BLAKE.

During the latter part of last July, being up in Tioga County and having a day to spare, I concluded to try that section entomologically, so, early in the morning, got my traps together and found a *native* who agreed to take me in his buggy, in which we rode to a wild spot not far from Niles Valley, and about the roughest ride I ever experienced. We halted close to a deep ravine which looked promising, and climbing down among the rocks, which here are of gigantic proportions, began my survey. The rock formation I thought belonged to the *Laurent*ian group, but not being geologist enough to determine that point with certainty, mentioned it to Prof. Heilprin on my return, who soon satisfied me that my speculations were wrong.

Passing through the ravine I came upon a beautiful little valley, which the before-mentioned native said was called *Martin dale*, on account of the vast number of swallows that congregate there, and from appearances should judge it was a paradise for the botanist. At the northern end there was a small sheet of water called Chu*b Lake*, where I captured several species of hymenoptera among the water*cress on* the shore. Not far from the edge of the water I noticed a snake-*skin ner*vously twitching, and on investigating matters, found it contained several specimens of Necrophorus americana, Silpha americana and a species of Dermestes, which I bottled. Among the débris on the shore was a curious specimen of Xyloryctes satyrus, in which the *horn* was curved forward, but I unfortunately lost it.

In a dense *wood* on the opposite side of the lake there were ant hills and ants enough to satisfy even Dr. McCook had he been there. While examining the trees for Catocalæ five or six species occurred, among them C. relicta. In this wood I noticed a large number of Libellulidæ, apparently flying around a blue*jay ne*sting in a tall *Pine* tree, and I nearly dislocated my cervi*cal vert*ebræ

looking up to see what all the commotion was about. The jay appeared greatly agitated by the insects, and kept up a constant flutter and chatting. As it appears a *well es*tablished fact that the bluejay is not a strictly insectivorous bird, I could not account for its actions. Thinking to drive her from the nest I threw a stone at it, missed of course, but brought down a mass of yellow fungus that was full of Megalodacne heros, several of which I bottled.

In the neighborhood of the lake I captured specimens of Vanessa milberti, Feniseca tarquinius, Grapta J-album and Alypia octomaculata. I have never seen birds so abundant as they were in this valley, one I s*lew is* a Chordeiles virginianus, the nighthawk, the skin of which is now in my collection. The craw was literally stuffed with coleoptera, showing it was a better collector than myself.

As I had had a good day's collecting we took to our buggy again; after *riding* some distance a bolt broke, on account of the nice road spoken of above, and for a moment it looked as though I should lose the result of my trip, but we fortunately found a *smith* who soon put us in good shape, so that I arrived home in time for supper, and quite satisfied with my success.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

In the future all papers received for publication in the News will be printed according to date of reception.

PAMPHILA AARONI was found in abundance at Cape May last month by Mr. Witmer Stone. *C. eubule* was also found.

SOMETIMES at least a quart of mosquitos could have been gathered from under each electric light on Congress Hall porch, Cape May, N. J.

POMPILUS ÆTHIOPS Cress., was seen at Westville, N. J., carrying away a species of *Trochosa* which it had evidently just captured and killed, as the spider was bright and perfect. Wasp and spider were both bottled.

A NATURALIST observes, admiringly, "There is a butterfly, one of the world's 12,000 species, the tiny eye of which contains 17,000 facets." This will explain to small boys why the butterfly is such an expert in dodging a hat.

Prof. E. W. DORAN recently resigned the office of State Entomologist of Tennessee, which he had held for five years, having recently removed to Missouri. During his incumbency he furnished two reports and a catalogue of the insects of the State. Dr. F. W. GODING.

Mr. W. H. ASHMEAD intended to sail for Europe on September 3d, steamer "Munchen," to be abroad two years. He hoped to visit the large collections of the continent and pay especial attention to parasitic HYMENOPTERA; also expected to visit Italy and make some studies on orange insects.

I LATELY reared seven specimens of the larvæ of *Terias nicippe* to the chrysalis state. Five of the chrysalids were of the normal green color, and two were black. Mr. Scudder calls attention to the same occurrence in his book on the "Butterflies of the Eastern United States." His specimens disclosed the normal form of fly. H. SKINNER.

THE last of the MSS. for part 1 of the new "Handbook of the Destructive Insects of Victoria" with 13 colored plates has been handed to the government printer, and the work was to have been completed by the end of July. The prospectus has just been issued of a new book entitled, "A Manual of New Zealand Entomology," by Mr. Geo. Vernon Hudson, Fellow of the Entomological Society of London, of Wellington, New Zealand. The work will consist of about 150 pages, and will cotain 20 colored plates, illustrating over 100 species of typical New Zealand insects.

Mr. C. W. JOHNSON took a specimen of *Neonympha Mitchellii* at Dover, Morris Co., N. J. It agrees exactly with specimens of *Mitchellii* in the collection of the American Entomological Society received from Prof. Mitchell. *N. Mitchellii* was described by Prof. French in the Canadian Entomologist for February, 1889, p. 25. The types came from Cass Co., Michigan, and were found in upland dry meadows. The country around Dover, N. J., is rocky and hilly. It seems remarkable that this species has not been noticed before if it is at all plentiful, and also more remarkable that the first additional locality should be so far away from the original. Mr. Johnson's specimen was caught July 10, 1890. H. SKINNER.

I WAS pleased to read in ENTOMOLOGICAL NEWS the article about baiting insects with sugar, molasses, or other sweets. I have followed the advice given in the Lepidopterist's Calendar, London, 1875. It is to mix two tablespoonfuls of new rum with one pint of molasses. The rum gives flavor, and is, I suppose, more diffusible than saccharine matter alone, and will no doubt serve as a night-cap to RHOPALOCERA, and as an eye-opener to HETEROCERA. You will notice many LEPIDOPTERA feeding on over-ripe fruit in which vinous fermentation has commenced. During this process much alcohol and œnanthic ether is given off, attracting butterflies, etc. Under fruit trees, with the ground covered with decaying cherries, mulberries, pears, etc., you will find many, such as *Limenitis*, *Papilio*, *Grapta* and others, and to me it seems that they resort to fruit-bearing trees and bushes for their "toddy." Dr. RICHARD KUNZE.

COLIAS PHILODICE, var. *alba*.—I notice that the foot-note on p. 93, vol. 1, states that if the genitalia of my white *philodice* were examined it would probably be found to be a female. This I will venture to say was done the day it was captured, and it is a male without a doubt. I have forty specimens of *C. philodice* in my collection, including some very rare forms, but this white male seems the oddest of all. One pair (females) are of a pale lemon-yellow, and in some respects resemble the Swedish males of *C. palæno*; also yellow females without the submarginal rows of yellow spots on the upper side. Some females that are suffused with black and on the under side have a smoky-orange cast. Among the males I have a specimen that has the black border very narrow on the primaries and almost obsolete on the secondaries; this I think is var. *anthyale* of Hüb. This latter form I generally take among the Spring brood when I also find the very small specimens which seldom appear later in the season.

GEO. A. EHRMAN.

WHILE walking along the edge of a mountain stream I was surprised to see one of these butterflies (*Papilio macleyanus*) alight close to the water, into which it backed till the whole of the body and the lower part of the hind wings were submerged, the two forelegs alone retaining their hold of the dry land. After remaining in this position for something like half a minute it flew away, apparently refreshed. During the morning I noticed quite a number doing the same thing. In one instance no less than four were to be seen within a space of not more three yards, and to make sure that I was not deceived I captured several as they rose from the water, and found in each case the body and lower edge of the hind wings quite wet. While in the water the fluttering of the wings, so noticeable at other times, was suspended, and so intent were the butterflies in the enjoyment of their cold bath that they would hardly move, even when actually touched by the net. Apparently the heat of the weather drove them down to the water, as immediately they emerged they flew up again to the hillsides (GEO. LYELL, in the "Victorian Naturalist" for June, '90).

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of specimens to be limited to twelve (12) for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Such identifications as can be given will be published, according to number, in the issues of the NEWS. Address packages to ENTOMOLOGICAL NEWS, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

EUGENE R. FISCHER.—1, *Catocala amatrix;* 2, *Cybister fimbriolatus;* 3, *Ligyrus relictus;* 4, *Argiope cophinaria;* 5, *Spilosoma virginica;* 6, *Lygus pratensis;* 7, *Lopidea medea?;* 8, *Scarites substriatus.*

W. M. HILL.—1, *Tetraopes tetraophthalmus;* 2, *Silpha inæqualis;* 3, *Attelabus analis;* 4, *Geotrupes Balyi;* 5, *Trichius piger;* 6, *Canthon lævis;* 7, *Calopteron reticulatum;* 8, *Lachnosterna gibbosa;* 9, *Epicauta cinerea;* 10, *Epicauta strigosa;* 11, *Dineutes sp.?*

Entomological Literature.

SECOND ANNUAL REPORT OF THE EXPERIMENT STATION KANSAS STATE AGRICULTURAL COLLEGE, p. 206. Some Insects Inj. to the Bean.

JOURNAL OF THE ASIATIC SOCIETY OF BENGAL, vol. lviii, pt. 2, Suppl. No. 1.—Catalogue of the Insecta of the Oriental region, No. 1. Order COLEOPTERA, Family CICINDELIDÆ, by E. T. Atkinson. Catalogue of Insecta 2. Order RHYNCHOTA, Sub-order HEMIPTERA-HETEROPTERA. Family CAPSIDÆ, by E. T. Atkinson, with bibliographical table, etc., 174 pp. This is an important paper to American students, as it includes the species of the world, vol. lviii, pt. 2, No. 4, 1889. On Certain Lycænidæ from Lower Tenasserim, by William Doherty, Cincinnati, U. S. A., pp. 31, pl. 1. A number of new species are described.

ZEITSCHRIFT FUR WISSENSCHAFTLICHE ZOOLOGIE xlix, heft 4, 1890.—The eye of Caterpillars and Phryganid larvæ, by O. Pankrath, 2 plates.

ZOOLOGISCHER ANZEIGER, 19 May and 2 June, 1890.—Analytical Chemical Researches on living caterpillars, pupæ and butterflies, and on their secretions, by F. Urech.

THE VICTORIAN NATURALIST June, 1890.—Some Notes on the Transformations of Australian LEPIDOPTERA, by Hy. Edwards.

TRANSACTIONS AND PROCEEDINGS OF THE NEW ZEALAND INSTITUTE, vol. xxii, 1889.—Further notes on Coccididæ, with descriptions of new species from Australia, Fiji and New Zealand, by W. M. Maskell. On some species of Psyllidæ in New Zealand, by W. M. Maskell. On some Aleurodidæ from New Zealand and Fiji, by W. M. Maskell. An entomological tour on the table-land of Mt. Arthur, by G. V. Hudson. *Eristalis tenax* and *Musca vomitoria* in New Zealand, by G. V. Hudson. Descriptions of New Zealand LEPIDOPTERA, by E. Meyrick. Notes on a collection of Pselaphaidæ from the neighborhood of Clevedon, southern Wairoa, by Capt. T. Brown. Description of a new species of *Argiope* from Fiji, by A. T. Urquhart. On two species of *Aranea* new to science from the Jenolan Caves, New South Wales, by A. T. Urquhart. Description of new species of Araneidæ, by A. T. Urquhart. Description of new species of New Zealand Araneæ with notes on their habits, by P. Goyen. On the occurrence of the Black Vine-weevil (*Otiorhynchus sulcatus*) in Nelson, by R. I. Kingsley.

JOURNAL OF THE BOMBAY NATURAL HISTORY SOCIETY, vol. v, No. 1.—The Butterflies of the Central Provinces, by J. A. B. A Preliminary List of the Butterflies of Mysore, by E. Y. Watson. Notes on Indian Ants, by George Alexander. J. Rothney. vol. v, No. 2. Description of a new Morphid Butterfly from Northeastern India, by Lionel de Niceville. Butterflies of the Central Provinces, by J. A. Betham (continued).

A MONOGRAPH OF ORIENTAL CICADIDÆ, by W. L. Distant. Part 3, pp. 49–72. With two plates. June, 1890. Contains descriptions and figures of species of *Cosmopsaltria* and *Pomponis*.

THE VICTORIAN NATURALIST, July, 1890.—Notes on the Geographical Distribution of some Australian Buprestidæ, Pt. 1, by C. French.

CATALOGUE OF INSECTS FOUND IN NEW JERSEY, by John B. Smith. From the Final Report of the State Geologist, vol. II. This makes a large volume of 486 pages and covers all the orders. The catalogue has been compiled from all available sources, and names of species not actually recorded from the State, but supposed to be found there are inserted. It is an open question whether this should have been done; 6098 species are listed, Coleoptera coming first, with 2227; Lepidoptera next, with 1140, and Hymenoptera third, with 1074. The other orders have comparatively fewer species recorded, not because they do not exist in the State, but because they have not received the attention they deserve from entomologists. The list can't fail to be useful to both the field worker and the systematist.

CONTRIBUTION TOWARD A MONOGRAPH OF THE INSECTS OF THE LEPIDOPTEROUS FAMILY NOCTUIDÆ OF TEMPERATE NORTH AMERICA.—Revision of the species of the genus Agrotis, by John B. Smith. The above is Bulletin No. 38, United States National Museum, 231 pages, 5 plates, 83 figures. The old genus Agrotis is divided into sixteen genera and many of these subdivided into convenient groups. Descriptions of the species with habitat and notes are given and a number of new ones described.

BIOLOGIA CENTRALI-AMERICANA. Part 86, June, 1890.—Arachnida-Acaridea, by Otto Stoll (pl. XV, COLEOPTERA, vol. ii, pt. 1, by D. Sharp (pl. 10), vol. iv, pt. 2, by G. C. Champion (pp. 161–184); vol. vi, pt. supplement, by M. Jacoby (pp. 185–200); HYMENOPTERA, vol. ii, by P. Cameron (pp. 89–96, pl. 6); LEPIDOPTERA-HETEROCERA, vol. i, by H. Druce (417–424); DIPTERA, vol. ii, by F. M. van der Wulp (pp. 145–176, pl. 4).

THE COLORS OF ANIMALS, THEIR MEANING AND USE, ESPECIALLY CONSIDERED IN THE CASE OF INSECTS, by Edward Bagnall Poulton, M.A., F.R.S. International Scientific Series, by D. Appleton & Co., New York, 339 pages, illustrated. This is a very interesting work to the entomologist, and should be in every library. Some of the subjects treated are the Physical Cause of Animal Colors, Protective Resemblance, Dimorphism, Warning Colors, Protective Mimicry, Sexual Coloring, etc.

AMERICAN SPIDERS AND THEIR SPINNING-WORK.—A Natural History of the Orbweaving Spiders of the United States with Special Regard to their Industry and Habits, by Henry C. McCook, D.D., vol. ii. This fine volume is handsomely illustrated with five colored plates and 401 cuts, and consists of 469 pages. Dr. McCook is to be congratulated on this grand addition to spider literature.

THE ENTOMOLOGIST, September, 1890.—Additions to the British List of Deltoids. Pyralides and Crambi, since 1859 (with plates), by Richard South. Notes on some species of Gall-gnats (Cecidomyiæ), by T. D. A. Cockerell. Contributions to the Chemistry of Insect Colors, by T. H. Perry Coste. An addition to the Plusiidæ of Britain, by R. South. Five Days' Collecting in Normandy, by J. H. Leech. Entomological Notes, Captures, etc. Doings of Societies.

SECOND ANNUAL REPORT OF THE SOUTH CAROLINA EXPERIMENT STATIONS for 1889. Ten pages are devoted to Entomology, by Ellison A. Smyth, Jr., botanist and entomologist.

VERHANDLUNGEN DER K. K. ZOOL.-BOT. GESELLSCHAFT IN WIEN, xl, 2 Quartal. June, 1890. On the connecting links between the orthorraphic and cyclorrhaphic DIPTERA and those between Syrphidæ and Muscariæ, by Dr. Fr. Brauer. On Lorrainian Gall Flies,* by J. J. Kieffer. Explanation of J. C. Savigny's plates of Orthoptera in the "Description de l'Egypte," by Dr. H. Krauss. On the adaptation of the colors of butterflies and caterpillars to their surroundings, and on the character of the Lepidopterous fauna of the Kilima-Ndjaro district in East Africa, by A. Rogenhofer, etc.

COMPT. RENDU. SOCIETE ENTOMOLOGIQUE DE BELGIQUE, July 5, 1890. —Causeries Odonatologiques, by E. de Selys-Longchamps; reviews Dr. Hagen's recent synopses of *Calopteryx* and *Anax*, with a note on some of the American *Mecistogasters*. A new type of underground Prionid, by A. Lameere: *Geoprionus* n. gen., type *G. syntheticus* n. sp., Rio Brazil.

VERHANDLUNGEN DES NATURFORSCHENDEN VEREINES IN BRUNN, xxvii, 1888 (Brünn, 1889).—The Lepidoptera of the Achal-Tekke District, by H. Th. Christoph; a bibliographical and geographical list of the species from this district of Turkestan. Identification of the European COLEOPTERA. Family Phalacridæ,* by C. Flach, 1 pl. An entomological excursion from Brünn to the borders of Transylvania in June, 1888, by Dr. A. Fleischer, with a list of Coleoptera* then collected. Coleopterological Results (of the expedition in Transcaspia in 1886 and 1887, conducted by Dr. G. Radde, Dr. A. Walter and A. Konchin) by E. Reitter;* *Microjulistus*, *Colposcythis*, *Anidania*, *Adoxinia*, new genera.

LE NATURLISTE (Paris), Aug. 1 and other numbers, 1890. New lepidoptera from Ecuador are described by P. Dognin.

ANATOMISCHER ANZEIGER, July 19, 1890.—Is the Ommatidium a Hair-bearing sense Bud? by William Patten.

BULLETIN DE LA SOCIETE PHILOMATHIQUE DE PARIS, 8e serie, ii, 1890. Note on the lyriform organs of Arachnids. Note on the anatomical structure of the pecten of scorpions and the coxal *raquettes* of the Galeodæ. Note on the movement of the limbs and jointed hairs in the Arthropoda, by P. Gaubert.

* Contains new species other than North American.

JAHRESHEFTE DES VEREINS FUR VATERLANDISCHE NATURKUNDE IN WURTEMBERG, xlvi, 1890.—The fly *Teichomyza fusca* Marx., and The odor-producing apparatus in butterflies, by Dr. E. Hofmann.

DEUTSCHE ENTOMOLOGISCHE ZEITUNG, 1890, heft 1.—Contains papers on the COLEOPTERA, describing many new species, but none from North America, except *Veturius sinuatocollis* Kuwert, Costa Rica. Some of the chief papers are some new Passalidæ A. Kuwert (*Paxilloides* n. gen.). New analytical synopsis of the genus *Omoplus* E. Reitter (*Omophlina*, *Heliosthræma* n. gen.). Analytical revision of the genus *Amphicoma* E. Reitter. New Coleoptera from Europa, the bordering countries and Siberia, with remarks on known species, by E. Reitter, etc.

REVUE BIOLOGIQUE DU NORD DE LA FRANCE, August, 1890.—Notes on the Thysanoura, iii. On some new, or little known species collected at Croisic, by R. Moniez.

ATTI DELLA SOCIETA ITALIANA DI SCIENZE NATURALI, xxxii, Milan, 1889.—Study on the structure and function of the organs adhering to the tarsi of Coleoptera, by P. Paolo, 4 plates.

COMPTE RENDU. SOCIETE ENTOMOLOGIQUE DE BELGIQUE, Aug. 2, 1890. —On the unity of origin of the Arthropod Type, by A. Lameere.

ZOOLOGISCHER ANZEIGER, Aug. 4. 1890.—On the developmental history of *Platygaster instricator* L. (*femorator* Dalm.) by N. Kulagin.

ZOOLOGISCHE JAHRBUCHER, v, heft 2, 1890.—General Biology of Butterflies, by Dr. A. Seitz; the first part only is published now, and treats of the geographical distribution of butterflies and their dependence on climatic influences. Contribution to the knowledge of the West African Orthoptera,* by Dr. H. Krauss, 1 pl.

COMPTE RENDU. CONGRES INTERNATIONAL DE ZOOLOGIE A PARIS, 1889-1890.—On the artificial importation of parasites and natural enemies of noxious insects in vegetation, by C. V. Riley.

ACTES DE LA SOCIETE LINNEENNE DE BORDEAUX, xlii.—Study on the species of Avicularidæ which inhabit the north of Africa.* Revision of the Avicularidæ of the republic of Ecuador.* Descriptions of new African species of the family Avicularidæ,* by E. Simon. A number of new genera are characterized in these three papers.

BULLETIN DE LA SOCIETE D'ETUDES SCIENTIFIQUES D'ANGERS. New series, xviii. Catalogue of the COLEOPTERA of Maine-et-Loire, 2d part, by M. Gallois.

NOUVELLES ARCHIVES DU MUSEUM D'HISTOIRE NATURELLE, 3d series, i, fasc. 1-17, 18-36. Paris, 1889. Researches on the insects of Patagonia, collected by the In. expedition sent to observe the transit of Venus at Santa Cruz, Patagonia, in 1882, by E. Lebrun, L. Fairmaire and P. Mabille. Includes the Coleoptera and Lepidoptera, 3 plates.

* Contains new species other than North American.

SOCIETE D'HISTOIRE NATURELLE DE TOULOUSE, xxiii, 1889.—Materials contributing to the entomological fauna of the south of France—Hemiptera, by M. Marquet.

TERMESZETRAJZI FUZETEK (Budapest), xiii, 1890.—Contributions to the distributions of Galls, with particular regard to the neighborhood of Budapest, v, Szepligeti.

ZOOLOGISCHER ANZEIGER, Aug. 18, 1890.—On the hermaphroditic function of the Sexual Glands of the male of *Phyllodromia* (*Blatta* L.) *germanica*, by R. Heymons.

ENTOMOLOGISCHE NACHRICHTEN, xvi, No. 14, July, 1890.—On Dimorphism and Mimicry in Butterflies, by L. Glaser.

No. 15, August, 1890.—New species of Apidæ, by A. Schletterer, mostly from Chili.

No. 16, August, 1890.—Three papers on the Coleopterous genus *Athous* and its allies,* by E. Reitter. *Elathous* n. gen.

Doings of Societies.

THE ENTOMOLOGICAL SOCIETY OF WASHINGTON, June 5, 1890.—Mr. Ashmead, under general notes, announced the discovery of a genus of Proctotrupidæ new to the United States. The insect *Iphitrachelus americanus* is interesting as furnishing a connecting form between the subfamilies Ceraphroninæ and Platygasterinæ.

Mr. Schwarz exhibited a specimen of *Throscus pugnax*, which species is new to the fauna of the District.

Prof. Riley presented a paper "On the Difficulty of dealing with Lachnosterna," in which he described the attacks of those beetles on certain large trees, especially Chestnut and Swamp Oak, having a height of about thirty feet which had been transplanted to his grounds last February. The successive appearance and work of the several species of Lachnosterna were described and the experiments with remedies detailed. The latter consisted in spraying with strong whale oil and tobacco soap solution, and later with London Purple at the rates of one pound to 125 gallons of water. The applications were satisfactorily made, but proved ineffective. The first did not prevent the attacks of the beetles at all, and while the second resulted in the poisoning of many of the beetles as indicated by the finding of dead ones on the ground, it was of little value in limiting the onslaught. Prof. Riley deduced from his experiments that it was practically impossible to protect large trees from Lachnosterna. It was shown also that the beetles came from the ground near the trees, and appear to have a predilection for newly transplanted trees. The injury consisted in the gnawing off of the leaves at the base of the petiole.

* Contains new species other than North American.

The paper was discussed by Messrs. Fernow, Riley, Schwarz, Howard and Mann.

In a paper entitled "Notes on Xyleborus," Mr. Schwarz commented upon the discovery of a wild food-plant of *Xyleborus dispar* (*pyri*). This Scolytid had been found quite recently in the vicinity boring and ovipositing in young shoots of *Liriodendron tulipiferum*. In the same branches another species, *X. tachygraphus*, was discovered, and Mr. Schwarz exhibited and described its galleries. Discussion followed by Messrs. Riley, Schwarz, Ashmead and Fernow.

Mr. Howard read a paper entitled, "The Habits of Eurytoma," in which he called attention to the fact that heretofore the generally-surmised parasitic habit of the members of this genus had never been conclusively shown; and the close relationship of *Eurytoma* with the Phytophagic genus *Isosoma* would lead to the inference that the former might be, in part at least, inquilines and not true parasites. The following of a certain species from the larval stage to the pupal, in which they were at once recognized as a species of *Eurytoma*,* settled in one instance at least the question of larval habit. An Oak gall, *Cynips Quercus-prunus*, was found, on cutting it open May 17th, to contain six full grown parasitic larvæ, afterwards determined as given above, and the remains of a larva which they had nearly devoured.

The paper was discussed by Messrs. Riley, Howard and Ashmead.

C. L. MARLATT,
Recording Secretary.

DESCRIPTION OF THE LARVA OF GORTYNA NITELA GUEN. AND ITS VARIETY NEBRIS.—Length full grown 1¼ inches. Uniform pale honey-yellow. Head dark honey-yellow, shining, bearing a few scattered, erect hairs. Mouth parts and a small spot on cheeks castaneous. Dorsal surface of second segment pale brown, shining, shaded laterally with blackish brown. Feet and stigmata black; segments three to eleven each with four brownish gray spots on the dorsum, the anterior larger and closer together than the posterior; each spot bearing a single erect hair; the twelfth segment having four quadrate spots of the same color, larger than the rest. A brownish gray spot just behind each stigma. Posterior segment slightly rugose, dark honey-yellow, margined with brownish black; bases of anal prolegs pale brown. Feeds in the stems of the great rag weed (*Ambrosia trifida*) and burdock (*Arctium lappa*). The larvæ went down July 30th, and the imagos emerged August 28th.

Two broods raised this season by my friend, P. Stephens, Montgomery County, exhibit both forms about evenly divided.—C. A. B.

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* The imagos obtained later proved to be *Eurytoma prunicola* Walsh.

ENTOMOLOGICAL NEWS for September was mailed August 28, 1890.